

Contents

Articles

- 3 Chen, J., Waloszek, D. & Maas, A.: A new 'great-appendage' arthropod from the Lower Cambrian of China and homology of chelicerate chelicerae and raptorial antero-ventral appendages
 - 21 Huang, D.-Y., Vannier, J. & Chen, J.-Y.: Anatomy and lifestyles of Early Cambrian priapulid worms exemplified by *Corynetis* and *Anningvermis* from the Maotianshan Shale (SW China)
 - 35 Cecca, F. & Macchioni, F.: The two Early Toarcian (Early Jurassic) extinction events in ammonoids
 - 57 Yacobucci, M.M.: Buckman's Paradox: variability and constraints on ammonoid ornament and shell shape
 - 71 Montuire, S. & Brunet-Lecomte, P.: Relation between climatic fluctuation and morphological variability in *Microtus* (*Terricola*) *grafi* (Arvicolinae, Rodentia) from Bacho Kiro (Bulgaria, Upper Pleistocene)
 - 79 Arenillas, I., Arz, J.A. & Molina, E.: A new high-resolution planktic foraminiferal zonation and subzonation for the lower Danian
 - 97 Raevskaya, E., Vecoli, M., Bednarczyk, W. & Tongiorgi, M.: Billingen (Lower Arenig/Lower Ordovician) acritarchs from the East European Platform and their palaeobiogeographic significance
 - 113 Wani, R.: Experimental fragmentation patterns of modern *Nautilus* shells and the implications for fossil cephalopod taphonomy
 - 127 Dornbos, S.Q., Bottjer, D.J. and Chen J.-Y.: Evidence for seafloor microbial mats and associated metazoan lifestyles in Lower Cambrian phosphorites of Southwest China
 - 139 Yang, X., Jiarun, L. and Guijin, S.: Extinction process and patterns of Middle Permian Fusulinaceans in southwest China
 - 149 Wisshak, M., Volohonsky, E., Seilacher, A. and Freiwald, A.: A trace fossil assemblage from fluvial Old Red deposits (Wood Bay Formation; Lower to Middle Devonian) of NW-Spitsbergen, Svalbard
 - 165 Hautmann, M.: Early Mesozoic evolution of alivincular bivalve ligaments and its implications for the timing of the 'Mesozoic marine revolution'
- Status of the International Geological Time Scale*
- 175 Gradstein, F.M. and Ogg, J.G.: Geologic Time Scale 2004 – why, how, and where next!
 - 183 Ogg, J.G.: Status of Divisions of the International Geologic Time Scale
 - 201 Walsh, S.L., Gradstein, F.M. and Ogg, J.G.: History, philosophy and application of the Global Stratotype Section and Point (GSSP)
 - 219 Bleeker, W.: Towards a 'natural' time scale for the Precambrian – A proposal
-
- 223 Barragan, R., Gonzalez-Arreola, C. and Villaseñor, A.B.: Palaeoecological significance of Barremian ammonite assemblages and facies variations from Southwest Mexico
 - 235 Hou, X.-G., Ma, X.-Y., Zhao, J. and Bergström, J.: The lobopodian *Paucipodia inermis* from the Lower Cambrian Chengjiang fauna, Yunnan, China
 - 245 Katsura, Y.: Sexual dimorphism in *Champsosaurus* (*Diapsida*, *Choristodera*)
 - 255 Lingham-Soliar, T.: Palaeopathology and injury in the extinct mosasaurs (Lepidosauromorpha, Squamata) and implications for modern reptiles
 - 263 Feng, W. and Kobayashi, I.: Microstructure of the linguliformean brachiopod *Linnarssonina* from the Lower Cambrian of Sichuan, China
 - 271 Harper, D.A.T., Villas, E. and Ortega, G.: *Lipanorthis* Benedetto from the Tremadocian of NW Argentina reidentified as a dalmanellidine: Significance for the origin and early radiation of the punctate orthide brachiopods
 - 281 Clarke, J.B.: A mineralogical method to determine cyclicity in the taphonomic and diagenetic history of fossilized bones
 - 285 Milàn, J., Clemmensen, L.B. and Bonde, N.: Vertical sections through dinosaur tracks (Late Triassic lake deposits, East Greenland) – undertracks, and other subsurface deformation structures revealed
 - 297 Knaust, D.: The oldest Mesozoic nearshore *Zoophycos*: evidence from the German Triassic
 - 307 Korn, D., Belka, Z., Fröhlich, S., Rücklin, M. and Wendt, J.: The youngest African clymeniids (Ammonoidea, Late Devonian) – failed survivors of the Hangenberg Event
 - 317 Eibye-Jacobsen, D.: A reevaluation of *Wiwaxia* and the polychaetes of the Burgess Shale
 - 337 Valli, A.M.E.: Taphonomy of Saint-Vallier (Drôme, France), the reference locality for the biozone MN17 (Upper Pliocene)
 - 351 Cózar, P. & Vachard, D.: Morphological adaptations of the late Mississippian problematic alga *Calcifolium* to fluctuating palaeoecologic environments
 - 365 Peng, S., Babcock, L.E., Robison, R.A., Lin, H., Rees, M.N. & Saltzman, M.R.: Global Standard Stratotype-section and Point (GSSP) of the Furongian Series and Paibian Stage (Cambrian)
 - 381 Balthasar, U.: Shell structure, ontogeny and affinities of the Lower Cambrian bivalved problematic fossil *Mickwitzia muralensis* Walcott, 1913
 - 401 Farlow, J.O. & Else, R.M.: Femoral dimensions and mid-thigh circumference in *Alligator mississippiensis*
 - 407 Donovan, S.K. & Jakobsen, S.L.: An unusual crinoid–barnacle association in the type area of the Danian (Paleocene), Denmark
 - 417 Palmer, T.J. & Wilson, M.A.: Calcite precipitation and dissolution of biogenic aragonite in shallow Ordovician calcite seas
 - 429 Gibert, J.M. de, Domènech, R. & Martinell, J.: An ethological framework for animal bioerosion trace fossils upon mineral substrates with proposal of a new class, fixichnia
 - 439 Kröger, B. & Keupp, H.: A paradox survival – report of a repaired *syn vivo* perforation in a nautiloid phragmocone
 - 445 Cherns, L.: Early Palaeozoic diversification of chitons (Polyplacophora, Mollusca) based on new data from the Silurian of Gotland, Sweden
 - 457 Zhang, Y. & Erdtmann, B.-D.: Astogenetic aspects of the dendroid graptolite *Airograptus* (Late Cambrian–Early Ordovician) and their phylogenetic implications

Lethaia Seminar

- 467 Ahmed, A.A-K., Lingham-Soliar, T. & Broderick, T.J.: Giant sauropod tracks from the Middle-Late Jurassic of Zimbabwe in close association with theropod tracks

Lethaia Discussion

- 124 Melchin, M. J., Jiayu, R., Gradstein, F., Koren, T.N. & Finney, S.C.: Stability in stratigraphy

Lethaia Forum

- 126 Aldridge, R.J., Kaesler, R.L. & Maddocks, R.F.: The International Palaeontological Association

Announcement

- 174 IUGS International Commission on Stratigraphy Awards 2004

Index of contributors

Ahmed, Ali Ait-Kaci	467	Keupp, H.	439
Aldridge, R.J.	126	Knaust, D.	297
Arenillas, I.	79	Kobayashi, I.	263
Arz, J. A.	79	Koren, T.N.	124
Babcock, L.E.	365	Korn, D.	307
Balthasar, U.	381	Kröger, B.	439
Barragan, B.	223	Lin, H.	365
Bednarczyk, W.	97	Lingham-Soliar, T.	255, 467
Belka, Z.	307	Ma, X.-Y.	235
Bergström, J.	235	Maas, A.	3
Bleeker, W.	219	Macchioni, F.	35
Bonde, N.	285	Maddocks, R.F.	126
Bottjer, D.J.	127	Martinell, J.	429
Broderick, T.J.	467	Melchin, M.J.	124
Brunet-Lecomte, P.	71	Milán, J.	285
Cecca, F.	35	Molina, E.	79
Chen, J.	3	Montuire, S.	71
Chen, J.-Y.	21, 127	Ogg, J.G.	175, 183, 201
Cherns, L.	445	Ortega, G.	271
Clarke, J.B.	281	Palmer, T.J.	417
Clemmensen, L.B.	285	Peng, S.	365
Cózar, P.	351	Raevskaya, E.	97
Gibert, K.M. de	429	Rees, M.N.	365
Domènech, R.	429	Robison, R.A.	365
Donovan, S.K.	407	Rücklin, M.	307
Dornbos, S.Q.	127	Saltzman, M.R.	365
Eibye-Jacobsen, D.	317	Seilacher, A.	149
Else, R.M.	401	Tongiorgi, M.	97
Erdtmann, B-D.	457	Vachard, D.	351
Farlow, J.O.	401	Valli, A.M.F.	337
Feng, W.	263	Vannier, J.	21
Finney, S.C.	124	Vecoli, M.	97
Freiwald, A.	149	Villas, E.	271
Fröhlich, S.	307	Villaseñor, A.B.	223
Gonzalez-Arreola, C.	223	Volohonsky, E.	149
Gradstein, F.M.	124, 175, 201	Waloszek, D.	3
Guijin, S.	139	Walsh, S.L.	201
Harper, D.A.T.	271	Wani, R.	113
Hautmann, M.	165	Wendt, J.	307
Hou, X.-G.	235	Wilson, M.A.	417
Huang, D-Y.	21	Wissak, M.	149
Jakobsen, S.L.	407	Yacobucci, M.M.	57
Jiarun, L.	139	Yang, X.	139
Jiayu, R.	124	Zhang, Y.	457
Kaesler, R.L.	126	Zhao, J.	235
Katsura, Y.	245		

